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ABSTRACT

Access to technology and the effective use of technology within schools, colleges, and departments of education (SCDEs) provide future teachers with the tools to meet the challenges of the classroom. As a part of the AACTE/NCATE Joint Data Collection Survey, 466 SCDEs participated in a technology survey. The results of the survey are reported in this paper in two sections. The first section analyzes the Innovation Component Configuration Maps (ICCMs), resulting in three categories concerned with student use of technology, faculty use of technology, and institutional capacity. The second section describes and analyzes the last five items of the survey: SCDE student access to computers, description of infrastructure and reported levels of use, technology funding for SCDEs, SCDE faculty/administration computers, Internet connections and required computer purchase, and full-time SCDE students and faculty. The report concludes that there is use and potential use of technologies within SCDEs, but that there are some areas for improvement: too few students are expected to use technology to share information in the campus classroom settings and most students do not use SCDE Web sites to obtain assignments. The study contains 18 figures in section one and 9 graphs and 10 tables in section two. An appendix contains the SCDE Technology Survey. (Contains 17 references.) (SPM)

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ED 422 268

The Use of Technology by Schools, Colleges, and Departments of Education 1996

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A Report to the
American Association of Colleges for Teacher Education
and the
Research and Information Committee
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The Use of Technology by Schools, Colleges, and Departments of Education 1996

Introduction

During the fall of 1996 a technology survey was distributed as part of the AACTE/NCATE Joint Data Collection Survey. This survey was sent to administrative units of all AACTE and NCATE member institutions (744) responsible for teacher education programs. These institutions are commonly referred to as Schools/Colleges/Departments of Education (SCDEs). The technology survey consisted of twenty-three items. The first eighteen items were Innovation Component Configuration Maps (ICCMs) for various technology innovations. The remaining five items dealt with SCDE student access to computers, infrastructure and levels of use, and technology funding levels. The first section of this report is an analysis of the ICCM data from that survey. The eighteen items were divided into three categories concerned with student use of technology, faculty use of technology, and institutional capacity. The second section of this report is a description and analysis of survey items nineteen through twenty-three. Usable responses were received from 466 SCDEs; a 63% return rate.

The Innovation Component Configuration Maps

Each ICCM contained three to four variations of the use of a specific technology innovation. The innovation configurations were designed to address concerns raised by the Office of Technology Assessment (OTA) report (1995) related to preservice teacher education and technology use, as well as the recent research related to technology use in institutions of higher education (Green, 1997, 1996; Green & Eastman, 1994). The variation to the extreme left described the ideal variation of the innovation. Variations to the right described uses with progressively less fidelity than the variations to the left. The data were collected and analyzed across all responding SCDEs (n = 466). The individuals completing the survey were asked to select the scenario which best described the majority (over 50%) of the SCDE faculty and/or students (see Appendix).

Student Use of Technology

The first ICCM dealt with use of technology during the student teaching experience. The responses to this ICCM are shown in Figure 1.

28%	41%	31%
Students are required to **design & deliver** instruction during student teaching which incorporates various technologies.	Students are required to **demonstrate** their use of at least one technology during student teaching.	Students have **no requirements** to incorporate technology within their instruction during student teaching.

Figure 1: Percentage of SCDEs reporting each variation for ICCM number 1.

At 28% of the SCDEs, students are required to design and deliver instruction which incorporates various technologies during the student teaching experience. At another 41% of the SCDEs, the students must demonstrate their use of at least one technology. Approximately 31% of the SCDEs do not require their student teachers to incorporate technology in their student teaching instruction. The two extremes represent a somewhat bipolar distribution with some student teachers required to incorporate a great deal of technology and others not required to incorporate any technology.

The importance of contextualized practice is a given for professional educational technologists who design and/or implement preservice teacher education curricula in the use and integration of technology. In a 1996 report, the National Commission on Teaching and America's Future (NCTAF) states, "Key elements of teacher learning are disconnected from each other. Coursework is separate from practice teaching; professional skills are segmented into separate courses..." (p. 32). Clearly, when a third of the preservice students are not required to incorporate the use of technology within their student teaching, the concern of the NCTAF is supported for technology use and integration.

The second ICCM dealt with students taking a required course on computer use, application, communication, and instructional integration. The results from this ICCM are shown in Figure 2.

61%	24%	15%
Students are required to take a course(s) on computer use, applications, communications, & **instructional integration**.	Students are required to take a course(s) on **computer applications**.	Students have **no course requirements** in technology.

Figure 2: Percentage of SCDEs reporting each variation for ICCM number 2.

Eighty-five percent of the responding SCDEs require students to take a course on computer applications. For 61% of the SCDEs, this course includes the integration of computer use and applications within instructional activities. This clearly shows that the vast majority of institutions are providing a course on the use of computers in educational settings and requiring their students to take the course. In a dissertation study generated from the 1996 SCDE Technology Survey, Tharp (in press) notes, "...SCDEs bear the

responsibility for providing instruction for preservice teachers which facilitates the integration of information technologies within their future classrooms and professional lives" (p. 35). Responses to this innovation configuration indicate that most preservice students are studying in programs which recognize the importance of developing technology skills among future educators.

The third ICCM dealt with student use of technology during the on campus portion of their program. The results from this ICCM are shown in Figure 3.

40%	50%	10%
Students are required to **design & deliver** instruction on campus incorporating various technologies.	Students are required to **demonstrate** their use of at least one technology on campus.	Students have **no requirements** to incorporate technology within their instruction on campus.

Figure 3: Percentage of SCDEs reporting each variation for ICCM number 3.

Students at 40% of SCDEs are required during the on campus part of their program to design and deliver instruction which incorporates technology. Students at half of the institutions are required to demonstrate the use of at least one technology during their on campus classes. These trends for on campus classes are positive. These percentages do not, however, extend into the student teaching experience as described in ICCM number 1 (see Figure 1). While on campus, 40% of the SCDEs have students designing and delivering technology rich instruction but during student teaching this number drops to 28%. The utilization and classroom integration of technology can be expected to drop further when these students become full-time teachers. Willis and Mehlinger (1996) agree that most teacher preparation programs include courses which emphasize fundamental computer operation and basic educational uses, but they argue that few programs actively explore the integration of those technologies within methods courses and student teaching, and that even fewer have designed a curriculum which integrates technology throughout preservice professional development. SCDEs must consider the need to identify and implement instructional strategies within required preparation coursework which scaffolds technology skill development for their students *and* which offer SCDE students multiple opportunities for contextualized practice.

The fourth ICCM dealt with the use of various technologies to share information in the classroom. The results from this ICCM are shown in Figure 4.

31%	67%	2%
Students are required to use computers, televisions & VCRs to **share information** in the classroom.	Students sometimes use computers, televisions & VCRs to **share information** in the classroom.	The students **do not use** computers, televisions or VCRs in the classroom.

Figure 4: Percentage of SCDEs reporting each variation for ICCM number 4.

Virtually every SCDE has students who use technologies such as computers, television, and VCRs to share information. Only 2% of the SCDEs reported that students did not share information in this way. Preservice educators' use of technology to share information is a critical early level of use. The true power of classroom technologies, however, lies in the ability of the teacher professional to adapt technology use to meet unique learner needs (socially, cognitively, and affectively) within the structure of the curricula.

The fifth ICCM dealt with students submitting and/or completing assignments using computer applications. The results from this ICCM are shown in Figure 5.

35%	46%	19%
Students are required to submit assignments using computer applications: **electronically or on a computer disk**.	Students are required to submit assignments completed using **computer applications**.	Students are **not required** to use a computer to complete assignments.

Figure 5: Percentage of SCDEs reporting each variation for ICCM number 5.

Eighty-one percent of SCDEs require students to use computer applications to complete assignments. A somewhat surprising 35% of SCDEs require students to actually submit assignments either electronically (i.e., via e-mail) or on a computer disk. The fact that nearly one-fifth of the reporting SCDEs, however, do not require students to use a computer to complete assignments is an indication that the Report of the AACTE Task Force on Technology (1997) is on target with core statements focused on the *application* of technology.

The sixth ICCM dealt with students submitting work and communicating with the faculty through e-mail. The results from this ICCM are shown in Figure 6.

64%	13%	23%
Students are **allowed** to submit their work & ask questions via e-mail.	The students **only communicate** with faculty via e-mail.	The students **do not use** e-mail to communicate with faculty.

Figure 6: Percentage of SCDEs reporting each variation for ICCM number 6.

Also somewhat surprising, students at 77% of the responding SCDEs use e-mail to communicate with faculty members. Students at 64% of the responding institutions are also allowed to submit their work via e-mail. Equally surprising, students at 23% of the institutions do not use e-mail to communicate with faculty members. This is an area of access and utilization which deserves attention so that all SCDE students have the alternative to communicate with the faculty via e-mail. There is also a serious need for SCDE students to see creative, appropriate instructional uses of technology modeled within their preparation programs.

The seventh ICCM dealt with the use of, and access to, the SCDE Web server. The results from this ICCM are shown in Figure 7.

26%	55%	20%
Students **may obtain** assignments & syllabi from a SCDE Web site.	Students **do not use** a SCDE Web site **to obtain** assignments & syllabi.	Students **do not have access** to a SCDE Web server.

Figure 7: Percentage of SCDEs reporting each variation for ICCM number 7.

At 26% of SCDEs, students may obtain assignments and course syllabi from the SCDE World Wide Web (WWW) site. This is an amazingly high percentage of adopters given that the WWW, in a real usable form, is only about twenty-four months old. Equally amazing is the fact that only 20% of institutions do not have access to an SCDE World Wide Web (WWW) site. While these figures are most impressive, once this baseline level of use has been established, the more important issue becomes the type of use(s) of the technology, not the amount.

- Faculty Use of Technology

The eighth ICCM dealt with faculty use of computers, televisions, and VCRs as interactive instructional tools. The results from this ICCM are shown in Figure 8.

45%	53%	1%
The faculty **regularly** uses computers, televisions & VCRs as **interactive** instructional tools during class periods.	The faculty **occasionally** uses some electronic technology to **present** information during class periods.	The faculty **does not use** electronic technology during class periods.

Figure 8: Percentage of SCDEs reporting each variation for ICCM number 8.

Faculty members at 45% of the SCDEs regularly use computers, televisions, and VCRs as interactive instructional tools during class periods. Faculty members at another 53% of SCDEs occasionally use some electronic technology to present information during

class periods. Faculty members at only 1% of SCDEs do not use electronic technology during class. These figures are particularly encouraging as the current literature continues to stress the importance of the use and modeling of multiple technologies by higher education faculty responsible for the preparation of future teachers (e.g., Awbrey, 1996; OTA, 1995; Willis & Mehlinger, 1996).

The ninth ICCM dealt with the faculty use of computers to conduct research and communicate with peers. The results from this ICCM are shown in Figure 9.

78%	22%	0%
The faculty uses computers **occasionally** to conduct research & communicate with peers.	The faculty uses computers **primarily** for word processing tasks.	The faculty **does not use** computers for professional purposes.

Figure 9: Percentage of SCDEs reporting each variation for ICCM number 9.

The results from this analysis indicate that faculty at 78% of the responding SCDEs use computers in their research and communication with peers. The remaining 22% use computers primarily for word processing. Although the first figure of 78% is impressive, the fact that faculty at 22% of SCDEs use the computer only for word processing is disturbing. Computers have multiple uses in education beyond simple word processing and the need for SCDE faculty to model both professional and personal uses of computer technologies is well documented.

The tenth ICCM dealt with the faculty use of e-mail to collaborate and communicate with colleagues and others. The results from this ICCM are shown in Figure 10.

67%	26%	7%
The faculty uses e-mail to **collaborate** on projects & communicate with other faculty **outside** this institution.	The faculty primarily uses e-mail for **communication within** this institution.	The faculty **does not use** e-mail.

Figure 10: Percentage of SCDEs reporting each variation for ICCM number 10.

At 67% of SCDEs the faculty members use e-mail to collaborate on projects and to communicate with faculty members at other institutions. Faculty members at 93% of the institutions use e-mail to communicate within the institution. Only 7% of the responding institutions do not have faculty members using e-mail. Obviously, SCDE faculty are making widespread use of this communication technology with their peers. This finding is interesting because of the related data from ICCM number 6 where this study documented that 23% of SCDE students do not use e-mail to communicate with faculty. SCDE faculty

should be encouraged to consider alternatives for the use of e-mail to support peer/instructor interactions and communication.

The eleventh ICCM dealt with the faculty use of the SCDE Web server. The results from this ICCM are shown in Figure 11.

20%	24%	37%	19%
The faculty uses the SCDE Web site to **display articles**, article abstracts & vitae.	The faculty uses the SCDE Web site to **display personal information** only.	The faculty **does not use** the SCDE Web site.	No SCDE Web Site

Figure 11: Percentage of SCDEs reporting each variation for ICCM number 11.

Faculty members at 44% of SCDEs use the SCDE WWW site to display personal information. Twenty percent of institutions have faculty members using the WWW site to display articles, abstracts, and vitae. At 37% of the institutions, the faculty does not use the SCDE WWW site. Nineteen percent of the responding institutions do not have an SCDE Web site. A number of surveys, however, had margin notes which stated plans for Web site development. This is a critical area for improvement in SCDEs.

The twelfth ICCM dealt with the faculty use of the World Wide Web to search for articles, abstracts, and personal information. The results from this ICCM are shown in Figure 12.

87%	0%	8%	4%
The faculty uses the World Wide Web to **search for articles**, article abstracts & vitae.	The faculty uses the World Wide Web to **search for personal information** only.	The faculty **does not use** the World Wide Web.	No Internet Hookup

Figure 12: Percentage of SCDEs reporting each variation for ICCM number 12.

At 87% of the institutions, faculty members use the World Wide Web to search for articles and abstracts. Faculty members at 8% of SCDEs do not use the World Wide Web. Only 4% of the institutions report that their faculty members do not have an Internet hookup. In a study of 660 two-year and four-year colleges and universities across the United States, Green (1997) found that Internet/WWW access rated the top priority in ranking issues related to networking and groupware across institutions of higher education (6.5 on a scale of 1 "Not Important" to 7 "Very Important"). It is interesting to note that the percentage of SCDEs with faculty who do not use e-mail (7%; see Figure 10) is quite close to the percentage of SCDEs with faculty who do not use the WWW (8%).

The thirteenth ICCM dealt with the faculty use of distance education technologies. The results from this ICCM are shown in Figure 13.

49%	37%	0%	15%
The faculty **uses** distance education technologies for highly **interactive** (between sites or between faculty & students) instructional purposes.	The faculty **does not have access** to the types of technology that **allow for interactivity** between sites or between faculty & students.	The faculty **does not use** distance education technologies.	No Distance Tech.

Figure 13: Percentage of SCDEs reporting each variation for ICCM number 13.

Faculty at 49% of the SCDEs use distance education technologies for highly interactive instructional purposes. Faculty at 52% of the SCDEs do have access to technology that supports interactivity or have no distance technology available. This would seem to be a prime area for growth in the use of technology.

Institutional Capacity

The fourteenth ICCM dealt with communication between administration and faculty using e-mail. The results from this ICCM are shown in Figure 14.

78%	19%	3%
The administration **communicates** with faculty & staff via e-mail.	The administration **does not communicate** with faculty via e-mail.	The administration **does not have access** to e-mail.

Figure 14: Percentage of SCDEs reporting each variation for ICCM number 14.

Administrators at 78% of responding institutions use e-mail to communicate with faculty and staff members. Administrators at 19% of SCDEs have access to e-mail but do not use it to communicate with faculty and staff. Only 3% of the responding institutions do not provide e-mail access to administrators. Recent discussions within the literature of e-mail use focus on mutating types of uses for e-mail. This innovation configuration data may represent SCDE administrations' current position along the adoption curve for e-mail (Rogers, 1995).

The fifteenth ICCM dealt with the wiring of classrooms for the use of computers and other technologies. The results from this ICCM are shown in Figure 15.

42%	56%	2%
Classrooms are **wired for Internet**, have televisions, VCRs & computers for instructional purposes.	Classrooms **have** televisions & VCRs available for instructional purposes.	Classrooms **have no** computers, televisions or VCRs available for instructional purposes.

Figure 15: Percentage of SCDEs reporting each variation for ICCM number 15.

Forty-two percent of institutions report that classrooms are wired for Internet access. Ninety-eight percent of institutions reported that they have classrooms with televisions and video cassette recorders available for instructional purposes. Only 2% of SCDEs do not have computers, televisions, or VCRs available for instructional purposes. As previously noted, this ICCM documents the *existence* of instructional technologies in SCDE classrooms, but leaves unanswered the more important question of how the technologies are being integrated and embedded within preservice teacher preparation curricula.

The sixteenth ICCM dealt with the delivery of instruction to off-site students using interactive technologies. The results from this ICCM are shown in Figure 16.

26%	31%	30%	13%
The SCDE delivers instruction to off-site students using **interactive technologies**.	The SCDE delivers instruction to off-site students using **computers, videos, text, or faculty travel**.	The SCDE **does not deliver** instruction to off-site students.	No Distance Tech.

Figure 16: Percentage of SCDEs reporting each variation for ICCM number 16.

Approximately 26% of SCDE institutions use interactive technologies to deliver instruction to off-site students. Another 31% of institutions use computers, videos, text, or faculty travel to deliver off-site instruction. Forty-three percent of institutions either do not deliver instruction to off-site students or do not have distance technologies available. As noted for ICCM number 13 (see Figure 13), the use of distance education technologies is a prime area for growth in SCDE technology use.

The seventeenth ICCM dealt with the availability of the most advanced electronic technologies and software applications. The results from this ICCM are shown in Figure 17.

Only 57% of the institutions report that students have access to the most advanced electronic technologies. Virtually all institutions provide students with access to basic word processing, spreadsheet, and presentation software. Students at less than 1% of the institutions do not have access to application software. As SCDEs utilize more technology

within their instruction and as public schools continue to seek improved efficiency and effectiveness through the use and integration of technology, preservice students will have greater needs for advanced technology skills beyond the basic applications such as word processing.

57%	43%	1%
Students have access to the **most advanced electronic technologies** and software applications.	Students have access to **basic** word processing, spreadsheet & presentation software.	Students **do not have access** to application software.

Figure 17: Percentage of SCDEs reporting each variation for ICCM number 17.

The eighteenth ICCM dealt with the institutional plans for the purchase, replacement, and upgrade of educational technologies. The results from this ICCM are shown in Figure 18.

55%	38%	7%
The institution has **budgeted** a plan to purchase, replace & upgrade a variety of educational technologies.	The institution has a **plan** to purchase & upgrade specific educational technologies.	The institution currently has **no plan** to purchase or upgrade educational technologies.

Figure 18: Percentage of SCDEs reporting each variation for ICCM number 18.

Only 55% of the SCDEs have budgeted a plan to purchase, replace, and upgrade technology. Another 38% of institutions have a plan for technology purchase and upgrade but the plans do not have a supporting budget. With the rapid changes in technology the lack of financial support for the plan is troublesome. This finding is even more troublesome when linked with the previous finding that only slightly more than half of the responding institutions provide students with access to the most advanced technologies (see Figure 17). Beneski and Waber emphasize the importance of keeping pace with the rapid change: "The costs associated with providing essential technologies are exacerbated by the fact that technology, in a very real sense, is a moving target. Over time, virtually all technology is either in the process of maturing (i.e., improving) or in the process of aging (i.e., slipping into obsolescence)" (p. 20). This study documents a critical need within most SCDEs to upgrade hardware and software but acknowledges that the resources are not available for this purpose. A parallel concern is related to the availability of resources (both technological and human) necessary to support SCDE faculty use and integration of educational technologies.

Typical SCDEs

The typical SCDE uses technology in a variety of different ways. The student at a typical institution will take a required course on computer use, applications, communications, and instructional integration. The student will demonstrate the use of at least one technology both on campus and during student teaching. Some students have access to the most advanced electronic technologies and software applications. Students sometimes use computers, televisions and VCRs to share information in the classroom setting. Students submit assignments completed using computer applications and may submit their work via e-mail. Students do not use a SCDE Web site to obtain assignments and syllabi.

The faculty at the typical SCDE occasionally use technology to present information during class, to conduct research, and to communicate with peers. The faculty does use e-mail to collaborate on projects and communicate with other faculty outside their institution. The faculty does not use the SCDE Web site, but uses other World Wide Web sources to search for information. The faculty uses distance education technologies for highly interactive instructional purposes. The administrators at the typical SCDE communicate with faculty and staff via e-mail. The SCDE classrooms have televisions and VCRs available for instructional purposes. The typical SCDE delivers instruction to off-site students using computers, videos, text, or faculty travel. The SCDE has a budgeted plan to purchase, replace, and upgrade a variety of educational technologies, but acknowledges serious concern for the funding of these plans.

The findings from this study of technology use by schools/colleges/departments of education show both that teacher preparation programs are using contemporary technologies and that there is need for improvement in the utilization of technology. Some SCDEs are on the cutting edge of technology use while others are using very little technology. For those SCDEs on the cutting edge, there is a continuing need to keep those technologies on the cutting edge. Many SCDEs are already doing this, as evidenced by the relatively large number of institutions using the new technologies of the World Wide Web. These SCDEs must continue to struggle with hitting the moving target of improved learning and teaching through the use of technology (Ely, 1996; National Council for Accreditation of Teacher Education (NCATE), 1993). Those SCDEs using very little technology need to make substantial improvements to provide adequate training for classroom teachers of the twenty-first century. As evidence of the dramatic changes within our public schools, the National Center for Education Statistics (NCES) (1997) reports that only 35% of all public schools do not currently have access to the Internet, but 87% of these schools plan to obtain access by the year 2000. The report also documents that 90% of the U.S. public

schools with Internet access had e-mail and 89% had access to the WWW. Ninety-four percent of schools with WWW access made it available to teachers, 86% made it available for the administration, and 74% made it available to students. The SCDEs which delay entry into the arena of technological preparation of their students will fall further behind in their ability to meet social, governmental, discipline-related, and workplace expectations for future teachers.

SCDE Student Access to Computers

Respondents to the SCDE Technology Survey were asked to describe the types of computers found in their labs, as well as the number of computer labs designated as SCDE student labs. Some institutions were not able to identify SCDE student labs. The researchers wish to note that many institutions reported there were multiple labs available across the campus' for open use by SCDE students as well as others. Computer lab data is reported only for those SCDEs which did not note that the labs described were for campus-wide use. When appropriate, data is reported by AACTE Region* (Zones I through VI), Type of Affiliation** (ACSESULGC/APU, AILACTE, TECSCU), and by institutions which identified themselves as NCATE affiliates.

There are differences between several of the AACTE Regions when comparing both the number of computers available and the total number of computer labs available for SCDE student use. In both cases, Zone IV had higher means than all others. Means were calculated across all reporting institutions (n = 466); not relative to the number of SCDE students within each region (see Graphs 1 and 2).

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*Zone I: CT, DE, DC, ME, MA, NH, NJ, NY, PA, RI, VT
Zone II: FL, GA, MD, MS, NC, PR, SC, VA, VI
Zone III: AR, IN, KY, OH, TN, WV
Zone IV: IL, IA, MI, MN, NE, ND, WI
Zone V: AL, LA, MO, OK, TX
Zone VI: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NV, NM, OR, SD, UT, WA, WI

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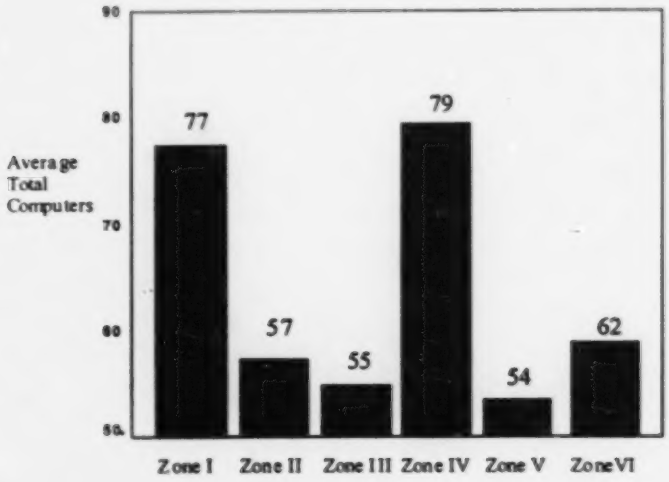
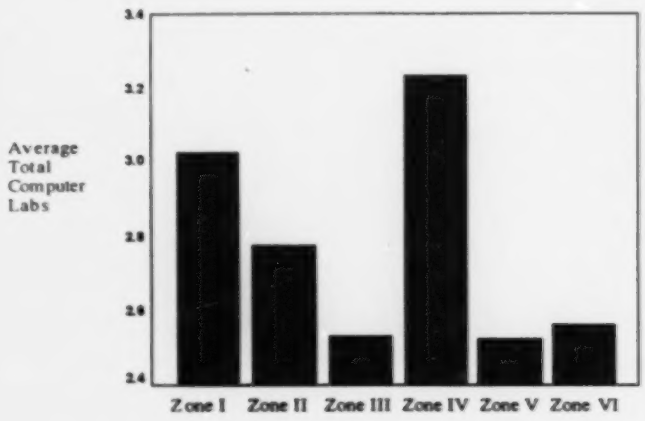
TECSCU: Teacher Education Council of State Colleges and Universities



Graph 1: Average Total Computers Available for SCDE Student Use by AACTE Region

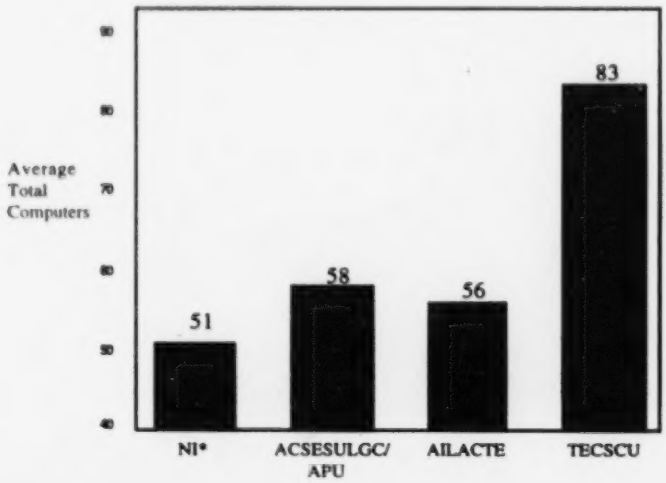


Graph 2: Average Total Computer Labs Available for SCDE Student Use by AACTE Region

The comparison of average total computers for SCDE student use by AACTE Type of Affiliation are displayed in Graph 3. The Teacher Education Council of State Colleges and Universities (TECSCU) SCDEs average about twenty-five more computers per institution than other affiliation types. Averages for the Association of Colleges and Schools of Education in State Universities and Land-Grant Colleges and Affiliated Private Universities (ACSESULGC/APU) and the Association of Independent Liberal Arts Colleges for Teacher Education (AILACTE) affiliates are not statistically different.

Of the 466 survey respondents, 334 were NCATE affiliates. On average, students at NCATE institutions have greater access to computers than do their non-NCATE counterparts. The NCATE mean (63.71 computers; see Table 1) is just slightly greater than the mean for all reporting SCDEs (62.2 computers), but nearly eight computers greater than for non-NCATE institutions. Average total computer labs available for SCDE students at NCATE institutions is about .4 labs greater than for non-NCATE SCDEs and virtually the same as the average for all reporting SCDEs.

Graph 4 illustrates the relationship between the average number of computers available for SCDE students at NCATE institutions and non-NCATE institutions by. AACTE Region. It is interesting that while Zones I and IV continue to have greater average values than other regions, the contribution of non-NCATE institutions to raising the average in Zone IV is significant. The opposite effect of non-NCATE institutions is documented in Zone II. Clearly, there is substantial variance among NCATE and non-NCATE institutions regarding the availability of computers for SCDE student use and the variance is not consistent or unique among AACTE Regions.

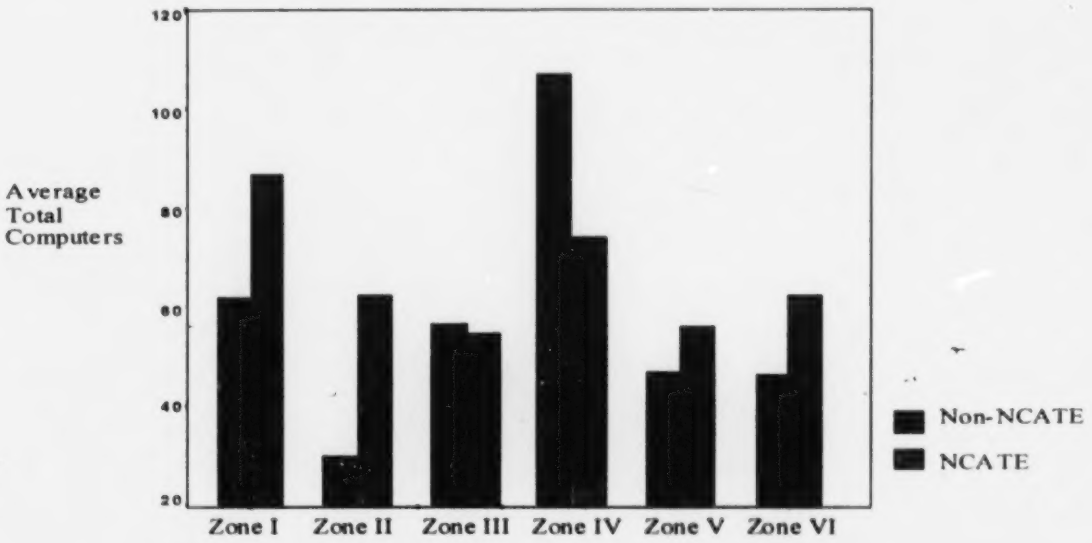


Graph 3: Average Total Computers Available for SCDE Student Use by Type of Affiliation

*NI: Reporting SCDEs Not Included within these affiliations
ACSESULGC/APU: Association of Colleges and Schools of Education in State Universities and Land-Grant Colleges and Affiliated Private Universities
AILACTE: Association of Independent Liberal Arts Colleges for Teacher Education
TECSCU: Teacher Education Council of State Colleges and Universities

NCATE Institutions	
Mean	63.71
# of Institutions	334
Total Computers	21279

Table 1: Average Total Computers for NCATE Institutions



Graph 4: Average Total Computers for NCATE Institutions by AACTE Region

Description of Infrastructure and Reported Levels of Use

Many SCDEs have made significant investments in both hardware and software to establish an appropriate infrastructure for the use and integration of computer technologies by SCDE faculty and to support the preparation of future educators. Tables 2, 3, and 4 display descriptive data for information technology users (calculated at the institutional level) in three SCDE groups: Faculty and Students, Faculty, Students, and for adequate/inadequate infrastructure. Differences in the descriptive data among the three groups is inconsequential, even when compared across AACTE Region, Type of Affiliation, and NCATE affiliation. The lowest documented use level is 80%. Eighty percent of the SCDE institutions in Zone V were classified as users of information technologies* for the combined faculty and students. The majority of institutional user percentages exceed 90%.

*For the purposes of this study, information technologies were defined, collectively, as computers, Internet, e-mail, fax, and World Wide Web (WWW).

Data is also reported specifically for adequate/inadequate infrastructure. Whether grouped by AACTE Region, Type of Affiliation, or NCATE affiliation, SCDE institutions have adequate infrastructure for the utilization of information technologies. Zone V represents the lowest percentage of institutions with adequate infrastructure at ninety-five percent. Additional chi-square analyses were run on these data which documented:

- the number of student user institutions for information technologies is significantly higher when institutional infrastructure is in place;
- the number of faculty user institutions for information technologies is significantly higher when institutional infrastructure is in place; and
- the number of faculty and student user institutions for interactive information technologies is significantly higher when appropriate infrastructure is in place.

Graphs 5, 6, and 7 compare non-NCATE institutions to NCATE institutions by AACTE Region for faculty user institutions of information technologies, adequate institutional infrastructure for information technologies, and student user institutions of information technologies. There are striking similarities between faculty user institutions and adequate institutional infrastructure for each region. The implication is that faculty, in particular, adopt information technologies based upon the ability to access adequate infrastructure for these technologies. It is also interesting to note that faculty user institutions outnumber (by percentage) student user institutions in every region and for both non-NCATE and NCATE affiliates except for non-NCATE institutions in Zone III. Further exploration would be necessary to determine if this phenomena is related to student access to adequate infrastructure or if SCDE student adoption of information technologies is dependent upon SCDE faculty modeling appropriate uses. With the increasing use of information technologies in K-12 school settings, SCDEs can expect to experience increased demands on the technological infrastructure by incoming students who expect to use information technologies for academic and personal productivity.

The number of SCDE faculty user institutions of information technologies is well above expected levels except for the non-NCATE institutions of Zone III (see Graph 5). Infrastructure is complete for most SCDEs; even the non-NCATE institutions of Zones III and IV document 90% of their institutions as having adequate infrastructure (see Graph 6). The number of student user institutions is least for non-NCATE affiliates in Zone III at just over 80% (see Graph 7). In combination, these findings clearly document the need for institutions to have adequate infrastructure in place for widespread use of information technologies to occur with any user group.

Zone		Variables			
		Fac & Stu Use	Fac Use	Infra	Stu Use
I	Mean	92%	98%	100%	94%
	# Reporting	50	50	50	50
	# Users	46	49	50	47
II	Mean	90%	95%	98%	92%
	# Reporting	97	97	97	97
	# Users	87	92	95	89
III	Mean	85%	90%	97%	93%
	# Reporting	96	96	96	96
	# Users	82	86	93	89
IV	Mean	90%	96%	99%	91%
	# Reporting	80	80	80	80
	# Users	72	77	79	73
V	Mean	80%	89%	95%	87%
	# Reporting	75	75	75	75
	# Users	60	67	71	65
VI	Mean	96%	99%	100%	96%
	# Reporting	68	68	68	67
	# Users	65	67	68	64
Total	Mean	88%	94%	98%	92%
	# Reporting	466	466	466	465
	# Users	412	438	456	427

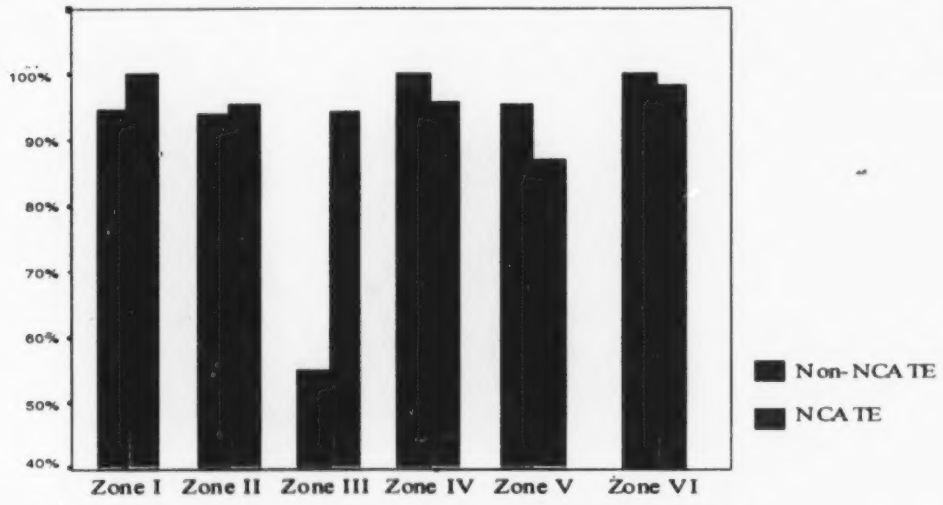
Table 2: Reported Institutional Users and Infrastructure by AACTE Region
Faculty & Students, Faculty, Infrastructure, Students

Type of Affiliation		Fac & Stu Use	Fac Use	Infra	Stu Use
NI*	Mean	85%	95%	100%	89%
	# Reporting	20	20	20	19
	# Users	17	19	20	17
ACSESULGC/APU	Mean	90%	94%	100%	92%
	# Reporting	203	203	203	203
	# Users	182	190	202	187
AILACTE	Mean	86%	92%	94%	92%
	# Reporting	154	154	154	154
	# Users	133	142	145	142
TECSCU	Mean	90%	98%	100%	91%
	# Reporting	89	89	89	89
	# Users	80	87	89	81
Total	Mean	88%	94%	94%	92%
	# Reporting	466	466	466	465
	# Users	412	438	456	427

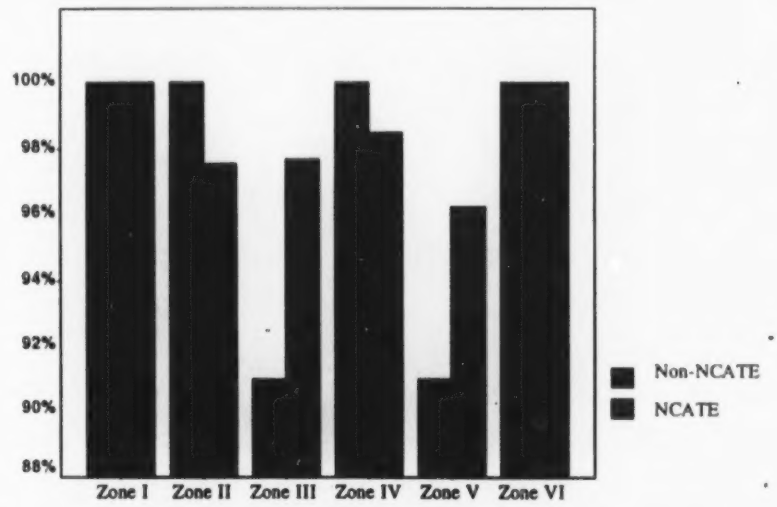
Table 3: Reported Institutional Users and Infrastructure by Type of Affiliation
Faculty & Students, Faculty, Infrastructure, Students
*NI: Reporting SCDEs Not Included within these affiliations

		Fac & Stu Use	Fac Use	Infra	Stu Use
NCATE	Mean	90%	95%	98%	92%
	# Reporting	368	368	368	368
	# Users	330	348	361	339

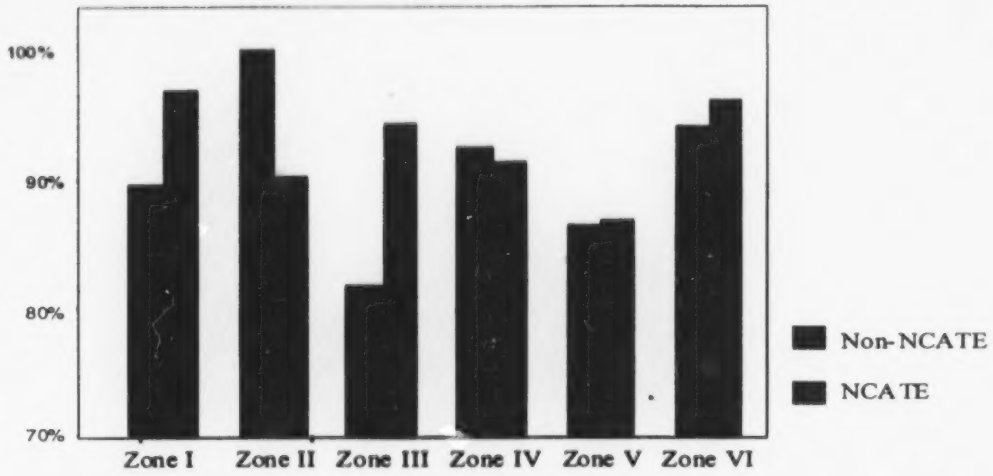
Table 4: Reported Institutional Users and Infrastructure by NCATE Affiliation
Faculty & Students, Faculty, Infrastructure, Students



Graph 5: Percentage of Faculty User Institutions for NCATE Affiliates
by AACTE Region



Graph 6: Percentage of Institutions with Adequate Infrastructure for NCATE Affiliates
by AACTE Region



Graph 7: Percentage of Student User Institutions for NCATE Affiliates by AACTE Region

Technology Funding for SCDEs

There is substantial variation between the funding levels and the funding sources for interactive information technologies within SCDEs. There are increasing pressures from within the higher education setting, and external to it, to address the larger issue of equitable access to technology. Resmer (1997) states, "As information technologies become an increasingly central part of learning experiences for students throughout all disciplines, universities and colleges face a major challenge in ensuring that all students have access to the technological infrastructure that will enable them to realize its full potential to transform their education" (p. 12). The importance of access for preservice teachers increases as access to technology and adequate preparation for the use and integration of technology within the classroom setting accounts for greater impact on their professional opportunities and success.

Tables 5, 6, and 7 document that, by far, institutional funding is relied upon most heavily to fund SCDE technology initiatives. It is interesting that Zones II and VI get significant funding from their state governments. The highest average level of funding was documented for Zone I AACTE member institutions (thirty-six of whom reported) with an average of 80% of their technology funding from institutional sources. The lowest average level was also documented for Zone I which had not a single institution report that they received no funding for technology from any source (see Table 5). The number of reporting institutions for this data varies from the total survey response (n = 466) due to missing data; percentages by Zone, Type of Affiliation, and NCATE Affiliation may not total 100% due to rounding.

Zone		Grant	Institutional	None	Private	SCDE	State
I	Mean	4%	80%	0%	3%	5%	9%
	# of Institutions	36	36	36	37	36	36
II	Mean	1%	44%	2%	4%	8%	25%
	# of Institutions	64	64	64	64	64	64
III	Mean	8%	59%	5%	4%	11%	10%
	# of Institutions	65	65	65	65	65	65
IV	Mean	13%	54%	5%	3%	9%	10%
	# of Institutions	57	57	57	57	57	57
V	Mean	10%	55%	4%	5%	10%	13%
	# of Institutions	53	51	52	53	53	52
VI	Mean	5%	39%	9%	2%	12%	32%
	# of Institutions	49	48	49	49	49	49
Total	Mean	10%	54%	4%	3%	9%	17%
	# of Institutions	324	321	323	325	324	323

Table 5: Average Percent of Funding for Technology in SCDEs by AACTE Region & Source

When funding sources are considered across SCDEs by their Type of Affiliation (see Table 6), institutional funding sources are still heavily dominant. Levels of funding among the other categories (Grant, None, Private, SCDE, and State) are not statistically different from the percentages documented by AACTE Region. In both cases, SCDEs average 10% of their funding for technology from grant sources, 54% from institutional sources, 3% from private sources, 9% from within the SCDE budget, and 17% from state sources.

NCATE institutions, too, rely most heavily on institutional sources for technology funding (average 50% of total funding; see Table 7). The average percent of funding from each of the other five sources is not statistically different from the means for all reporting institutions.

Type of Affiliation		Grant	Institutional	None	Private	SCDE	State
NI*	Mean	8%	69%	0%	4%	2%	16%
	# of Institutions	13	13	13	13	13	13
ACSESULGC/APU	Mean	8%	46%	4%	4%	12%	23%
	# of Institutions	145	144	145	146	145	145
AILACTE	Mean	12%	68%	4%	3%	6%	3%
	# of Institutions	106	105	106	106	106	106
TECSCU	Mean	9%	43%	7%	4%	10%	25%
	# of Institutions	60	59	59	60	60	59
Total	Mean	10%	54%	4%	3%	9%	17%
	# of Institutions	324	321	323	325	324	323

Table 6: Average Percent of Funding for Technology in SCDEs by Type of Affiliation & Source
*NI: Reporting SCDEs Not Included within these affiliations

NCATE	Grant	Institutional	None	Private	SCDE	State
Mean	10%	50%	5%	3%	11%	18%
# of Institutions	257	254	256	258	257	256

Table 7: Average Percent of Funding for Technology in NCATE SCDEs by Source

SCDE Faculty/Administration Computers

These researchers were interested in this data to the extent that it presents a general picture of the capacity of the SCDE program to integrate current information technologies within professional and instructional activities. For the most part, "other Windows" and "other Macs" are the predominant operating systems found on the desks of SCDE faculty/administration (see Tables 8 and 9). These two categories account for 50% of the total for the 446 reporting SCDEs. There is a reasonably strong percentage of PowerMacs and Pentiums also documented representing the current upper end for desktop computing hardware. This data suggests that some SCDEs already recognize the need to support faculty/administration use and integration of information technologies with adequate hardware. Eighty-seven percent of the computers used by SCDE faculty/administration are either "other Windows", "other Macs", PowerMacs, or Pentiums (see Table 8). On average, 4% of the 446 SCDEs responded that the majority of their faculty/administration had no computer. This value is not statistically different from the values reported for all other regions or institutional affiliations.

Several participating institutions reported independent percentages which totaled more than 100%. Question interpretation or multiple machines per faculty member may have been the cause. Table 8 displays the greatest value for average percentage of type of computer available: of the forty-six AACTE Zone I institutions which responded to this item, 34% of the faculty or administration have "other Windows" computers to use. Faculty/administration at the 355 reporting NCATE institutions (see Table 9) are most likely to be using "other Windows" (29%), "other Macs" or PowerMacs (20% each), or Pentiums (16%). It is quite positive that the majority of the percentages in the PowerMac and Pentium categories are in the neighborhood of 20%.

Green (1997) found that an average of 54.9% of the faculty at the 660 surveyed institutions of higher education have or own a computer and 50% of the administrators have or own a computer. The same study documents Windows 3.x (87%) and MS-DOS (80.6%), respectively, as the recommended /supported computer operating systems. Green's study also shows heaviest recommendation for Pentium desktop computers (68.8% of the institutions). Desktop computers ranked by recommended operating system were: (a) any PC-compatible, 70.5%, (b) any Macintosh, 40.6%, and (c) any UNIX system, 32.4%.

Table 8:

Summary of SCDE Faculty/Administration Computers by AACTE Region

Zone		Mac Port	No Comp	Oth Win	Oth Comp	Oth Mac	Power Mac	Pent	Win Port
I	Mean	1%	4%	34%	6%	20%	1%	20%	2%
	# Reporting	46	46	46	46	46	46	46	46
II	Mean	3%	4%	35%	7%	13%	15%	20%	4%
	# Reporting	96	96	96	96	96	96	96	96
III	Mean	3%	4%	28%	5%	23%	16%	19%	3%
	# Reporting	92	92	92	92	92	92	92	92
IV	Mean	4%	3%	23%	4%	22%	29%	12%	4%
	# Reporting	75	75	75	75	75	75	75	75
V	Mean	4%	6%	24%	6%	25%	15%	16%	4%
	# Reporting	71	71	71	71	71	71	71	71
VI	Mean	4%	.2%	26%	2%	24%	30%	14%	3%
	# Reporting	66	66	66	66	66	66	66	66
Total	Mean	3%	4%	29%	5%	21%	20%	17%	4%
	# Reporting	446	446	446	446	446	446	446	446

Table 9:

Summary of SCDE Faculty/Administration Computers for NCATE Institutions

NCATE	Mac Port	No Comp	Oth Win	Oth Comp	Oth Mac	Power Mac	Pent	Win Port
Mean	3%	4%	29%	5%	20%	20%	16%	4%
# Reporting	355	355	355	355	355	355	355	355

Internet Connections and Required Computer Purchase

A summary of the actual numbers of computers available for SCDE students and the average number of labs available can be found in Table 10. In addition, Table 10 documents two other interesting findings:

- Over 80% of all reporting institutions have Internet connections established for their SCDE faculty and administration; and
- Less than ten institutions (1.5% overall) of the 466 reporting SCDEs require their SCDE students to purchase a computer.

Across institutions of higher education, in general, 76% of faculty and administration have access to the Internet, 67% of the undergraduates, and 33% of the graduate students (Green, 1997). According to the NCES (1997), 65% of U.S. public schools had access to the Internet in fall of 1996, which represented a 15% gain in each of the last two consecutive years. Also of interest, 13% of all public schools reported that training for teachers in *advanced* [emphasis added] telecommunications was mandated by the school, district, or teacher certification agencies.

Green (1997) also found that 9.7% of the higher education institutions required or strongly recommended microcomputer ownership for all students and 10.8% required or strongly recommended microcomputer ownership for students in specific disciplines/programs. While the first finding of this study is cause for celebration, the second reminds us that information technologies are not yet accepted within SCDEs as a necessary tool for the professional preparation and development of SCDE students.

Table 10:

Summary of Computers Available in SCDE Computer Labs by Type of Affiliation, Faculty & Administration Connections to the Internet, Required Computer Purchase, and Total SCDE Computer Labs

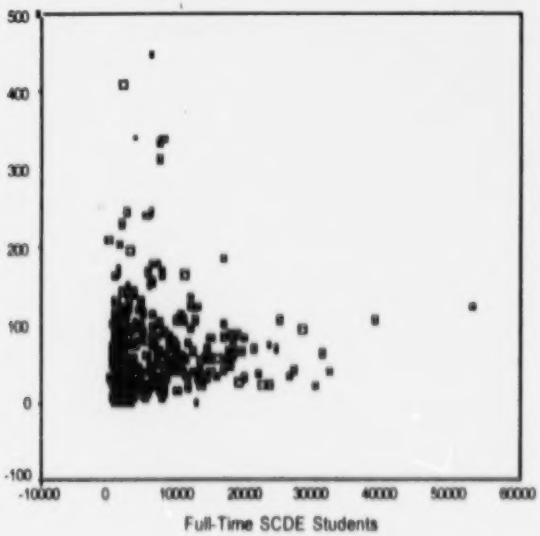
Type of Affiliation		Power Mac	Oth Macs	Pent	Oth Comp	Oth Win	% Faculty & Admin Connected to Internet?	Computers Required Purchase?	Total Labs
NI*	Mean	5	5	25	0	16	83%	0%	2.44
	# Reporting	13	13	13	13	13	12	17	16
	Minimum	0	0	0	0	0	5	0	0
	Maximum	20	24	120	5	140	100	1	11
ACSESULGC/ APU	Mean	14	11	12	6	14	83%	0%	2.84
	# Reporting	185	185	185	184	185	168	187	192
	Minimum	0	0	0	0	0	0	0	0
	Maximum	96	92	129	52	108	100	1	15
AILACTE	Mean	12	10	15	6	14	81%	0%	2.50
	# Reporting	132	132	132	131	132	124	144	141
	Minimum	0	0	0	0	0	0	0	0
	Maximum	92	72	184	134	142	100	0	18
TECSCU	Mean	19	16	24	8	16	86%	0%	3.03
	# Reporting	87	87	87	87	87	69	83	86
	Minimum	0	0	0	0	0	0	0	0
	Maximum	87	133	200	200	200	100	1	9
Total	Mean	14	12	16	6	15	83%	0%	2.75
	# Reporting	417	417	417	415	417	373	431	437
	Minimum	0	0	0	0	0	0	0	0
	Maximum	96	133	200	200	200	100	1	18

*NI: Reporting SCDEs Not Included within these affiliations

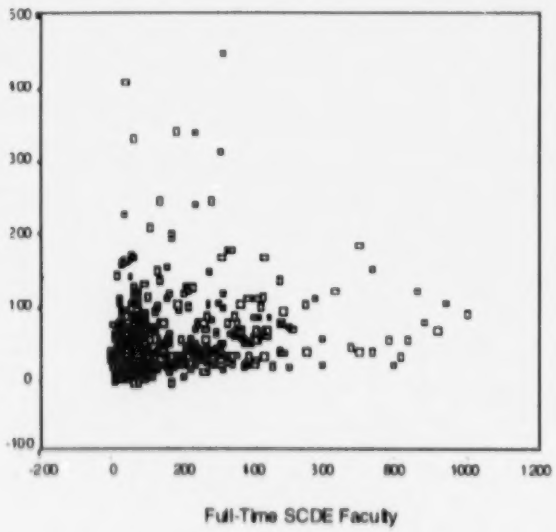
Full-Time SCDE Students and Faculty

When computer lab settings reach their capacity for use, individual use may also decline due to the perception that access to the technologies doesn't "really" exist. Graphs 8 and 9 are illustrations of the tremendous impact which SCDE students and faculty may have on campus-wide computer access. For SCDE students, a ratio of students to computers in the area of about 10 to 1 is most common (see Graph 8). For SCDE full-time faculty, the ratio drops markedly to a little less than 2 to 1 (see Graph 9). The general shape of both scatterplots indicates that there are outlier institutions for both groups, though. There are institutions where the number of faculty and/or students is far too great for the number of computers available; at the same time, there are outliers whose ratio is much better than 10 to 1 for students or 2 to 1 for faculty. Green (1997) documented the ratio of students to institutionally-owned computers available in labs or clusters at 19 to 1; for institutionally-owned desktop computer or workstation, the ratio fell to 7 to 1. Most

SCDEs currently fall somewhere within the range reported by Green for the higher education institutions' average ratio of students to computers.



Graph 8: Relationship of Full-Time SCDE Students to Total Available Computers



Graph 9: Relationship of Full-Time SCDE Faculty to Total Available Computers.

Conclusion

This study has documented many positive aspects of the use and potential use of interactive information technologies within SCDEs. Most SCDE students are required to

take a course on computer use, applications, communications, and instructional integration. Students typically must demonstrate the use of at least one technology both on and off campus. The majority of SCDE students have access to some advanced electronic technologies and software applications. Many students have the opportunity to submit assignments completed using computer applications and may submit their work via e-mail. SCDEs generally have very well equipped classrooms and their information infrastructure is generally part of a budgeted plan for purchase, replacement, and upgrades. In terms of adequate infrastructure, the AACTE member institutions which participated in this study are well prepared to meet this NCTAF (1996) challenge: "Schools of education ...need to model how to teach for understanding in a multicultural context, how to continually assess and respond to student learning, and how to use new technologies in doing so" (p. 77). Attention must now turn to designing, implementing, and evaluating preservice preparation environments which include embedded applications of these new technologies.

This study has also documented some areas for improvement, however. Too few students are expected to use computers, televisions and VCRs to share information in their campus classroom settings. Students do not use SCDE Web sites to obtain assignments and syllabi, implying that SCDE faculty are not making best use of the available information infrastructure. There is some evidence of higher level uses of the WWW (beyond searching for information) and appropriate applications of distance education technologies, but it appears that the majority of faculty have not reached a comfort level beyond basic user skills with these information technologies. Actual utilization and contextualized integration of these technologies within personal and workplace settings, for both SCDE students and faculty, is far from commonplace within SCDEs. These issues are characteristic of systems struggling to become technologically supported learning environments. Regarding the preparation of education faculty and education students for the use of computers in instruction and scholarship, Green (1997) documented current preparation levels in four areas:

1) institutional preparation of student technology skills over the next decade (mean = 3.3);
2) faculty preparation for instruction (mean = 3.1);
3) faculty preparation for scholarship (mean = 2.9); and
4) faculty preparation in Internet/WWW use (mean = 2.9).

(Means were reported based on a scale of 1 "Poor" to 5 "Excellent".)

The OTA (1995) report urges SCDEs to look beyond the issues of access to technology; to, instead, focus on identifying the barriers to effective *use* of technology within our schools. In particular, the report makes these suggestions: (a) define a vision for

technology use which takes into account new curricular and professional development possibilities; (b) develop a system for teacher training and ongoing support for curriculum integration which utilizes technology; and (c) allow enough time for all teachers to experiment with new technologies, share experiences with other teachers, plan lessons using technology, and attend technology courses and meetings. "For schools to improve, teachers must change. For teachers to change, there must be appropriate and promising practices and procedures (i.e., innovations) that they develop or adopt, and, when necessary, adapt. Student achievement and other desired outcomes are enhanced when teachers improve their practices and use more effective instructional resources" (Hall & Hord, 1987, p. 5). Funding technology initiatives, incentive plans, faculty preparation, and maintaining supervision over technology access will continue to plague SCDEs and institutional planning processes in general.

The holistic solutions to these challenges are complex, as they reside within complex systems. In a description of the Apple Classrooms of Tomorrow (ACOT) project, Sandholtz, Ringstaff, and Dwyer (1997) say that, "[T]echnology by itself was not the silver bullet. In fact, it added another layer of complexity, a whole new set of things for already overworked and stressed teachers to learn and manage...Its [technology] use in instruction and learning changed as teachers themselves changed" (p. 36). SCDEs have an obligation to strive for the effective use and integration of technology within our teacher preparation programs and our K-12 classrooms. Meeting that obligation will not occur without pain, planning, patience, and persistence at all levels of the education system. Positive movement will only occur with input from the human technology consumers: teachers, students, administrators, business people, politicians, technical experts, parents, and technologists. SCDEs have made tremendous recent progress toward technology integrated and supported teacher preparation, but we can't blink; a new millennium is just around the corner.

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Appendix

SCDE Technology Survey
(JDCS-1996)

Institution:_____INSTID:_____1996 JDCS Addendum

Schools, Colleges, and Departments of Education (SCDE) Technology Survey

Please circle the scenario which **best** describes the **majority** (over 50%) of your SCDE faculty and student uses of and access to various educational technologies.

Student Use

1	Students are required to **design & deliver** instruction during student teaching which incorporates various technologies.	Students are required to **demonstrate** their use of at least one technology during student teaching.	Students have **no requirements** to incorporate technology within their instruction during student teaching.	Unknown
2	Students are required to take a course(s) on computer use, applications, communications, & **instructional integration**.	Students are required to take a course(s) on **computer applications**.	Students have **no course requirements** in technology.	Unknown
3	Students are required to **design & deliver** instruction on campus incorporating various technologies.	Students are required to **demonstrate** their use of at least one technology on campus.	Students have **no requirements** to incorporate technology within their instruction on campus.	Unknown
4	Students are required to use computers, televisions & VCRs to **share information** in the classroom.	Students sometimes use computers, televisions & VCRs to **share information** in the classroom.	The students **do not use** computers, televisions or VCRs in the classroom.	Unknown
5	Students are required to submit assignments using computer applications: **electronically or on a computer disk**.	Students are required to submit assignments completed using **computer applications**.	Students are **not required** to use a computer to complete assignments.	Unknown
6	Students are **allowed** to submit their work & ask questions via email.	The students **only communicate** with faculty via email.	The students **do not use** email to communicate with faculty.	Unknown
7	Students **may obtain** assignments & syllabi from a SCDE Web site.	Students **do not use** a SCDE Web site **to obtain** assignments & syllabi.	Students **do not have access** to a SCDE Web server.	Unknown

Faculty Use

8	The faculty **regularly** uses computers, televisions & VCRs as **interactive** instructional tools during class periods.	The faculty **occasionally** uses some electronic technology to **present** information during class periods.	The faculty **does not use** electronic technology during class periods.	Unknown
9	The faculty uses computers **occasionally** to conduct research & communicate with peers.	The faculty uses computers **primarily** for word processing tasks.	The faculty **does not use** computers for professional purposes.	Unknown
10	The faculty uses email to **collaborate** on projects & communicate with other faculty **outside** this institution.	The faculty primarily uses email for **communication within** this institution.	The faculty **does not use** email.	Unknown
11	The faculty uses the SCDE Web site to **display articles**, article abstracts & vitae.	The faculty uses the SCDE Web site to **display personal information** only.	The faculty **does not use** the SCDE Web site.	No SCDE Web Site

(Please continue on reverse side)

12	The faculty uses the World Wide Web to **search for articles**, article abstracts & vitae.	The faculty uses the World Wide Web to **search for personal information** only.	The faculty **does not use** the World Wide Web.	No Internet Hookup
13	The faculty **uses** distance education technologies for highly **interactive** (between sites or between faculty & students), instructional purposes.	The faculty **does not have access** to the types of technology that **allow for interactivity** between sites or between faculty & students.	The faculty **does not use** distance education technologies.	No Distance Tech.

Institutional Capacity

14	The administration **communicates** with faculty & staff via email.	The administration **does not communicate** with faculty via email.	The administration **does not have access** to email.	Unknown
15	Classrooms are **wired for Internet**, have televisions, VCRs & computers for instructional purposes.	Classrooms **have** televisions & VCRs available for instructional purposes.	Classrooms **have no** computers, televisions or VCRs available for instructional purposes.	Unknown
16	The SCDE delivers instruction to off-site students using **interactive technologies**.	The SCDE delivers instruction to off-site students using **computers, videos, text, or faculty travel**.	The SCDE **does not deliver** instruction to off-site students.	No Distance Tech.
17	Students have access to the **most advanced electronic technologies** and software applications.	Students have access to **basic** word processing, spreadsheet & presentation software.	Students **do not have access** to application software.	Unknown
18	The institution has **budgeted** a plan to purchase, replace & upgrade a variety of educational technologies.	The institution has a **plan** to purchase & upgrade specific educational technologies.	The institution currently has **no plan** to purchase or upgrade educational technologies.	Unknown

19 For the **budgeted technology** plans, please indicate the percent of funding from each of these sources:

____% State Funding ____% Institutional Funding ____% SCDE Funding
____% Grant Funding ____% Private Source ____% No Funds

20 Indicate the percentage of SCDE faculty/administration who have the following computers **on their desk**:

Macintosh	**Windows**	**Portables**	
____% PowerPC Macs	____% Pentiums/586/686	____% Macs	____% no computer
____% other Macs	____% other Windows	____% Windows	____% other computers

21 What percentage of the faculty/administration computers are **connected to the Internet**? _____%

22 Please complete this table by indicating the number of computers in each SCDE student lab:

Computer	**Lab 1**	**Lab 2**	**Lab 3**	**Lab 4**	**Lab 5**	**Lab 6**
PowerPC Macs	_____	_____	_____	_____	_____	_____
other Macs	_____	_____	_____	_____	_____	_____
Pentiums/586/686	_____	_____	_____	_____	_____	_____
other Windows	_____	_____	_____	_____	_____	_____
other computers	_____	_____	_____	_____	_____	_____

23 Are SCDE students **required** to purchase, or supply, their own computer? Yes No